

## REMARKS

### A. Status of the Pending Application

Claims 47-74 are pending in the application. Claims 1-22 and 32 are cancelled. Claims 23-31 and 33-46 are withdrawn. Claims 53-74 have been added. Claims 47 and 49-52 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Xu *et al.* (U.S. Patent No. 5,689,374). Claim 48 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Xu *et al.* in view of Zhou *et al.* (U.S. Patent Publication No. 2004/0042729).

### B. Claim Objections

Claims 48-52 have been amended to correct dependencies on non-elected inventions.

### C. Rejections under 35 U.S.C. § 102(b): Claims 47 and 49-52

Claims 47 and 49-52 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Xu *et al.* (U.S. Patent No. 5,689,374). Amended claim 47 is directed to an apparatus for controlling the size and the phase of an electromagnetic beam, the apparatus comprising:  
a substrate and a vertically Graded Refractive index (vGRIN) multilayer structure film deposited on the substrate, where the multilayer structure includes a vGRIN film and  
a curved input sidewall and a curved output sidewall, the input sidewall being a sidewall on which the electromagnetic beam is incident on the apparatus, the output sidewall being a sidewall through which the electromagnetic beam leaves the apparatus. The apparatus is used to independently control a vertical focusing and a horizontal focusing of the electromagnetic beam. The Examiner alleges that Xu *et al.* discloses all of the recitations of claim 47. Applicants respectfully disagree.

Xu *et al.* is directed to a Graded Refractive Index (GRIN) lens and a method of manufacturing the lens. (Xu *et al.*, Abstract). Xu *et al.* discloses a GRIN lens formed as a plurality of adjacent zones of optical material, where each zone has a

refractive index different from the refractive index of an adjacent zone. *Id.* The GRIN lens is manufactured by creating a lens blank from optical material having a refractive index varying along the lens blank central axis. (*Id.*, Col. 6, ll. 38-40). The lens blank is divided in half and re-combined by merging the two halves to form the desired refractive index distribution in the final lens. (*Id.*, Col. 7, ll. 19-30). The optical lens blank is manufactured by stacking layers of optical material of selected thicknesses and indices of refraction, or fusing layers of glass frit in a mold and forming the layers in the mold by a fusion process. (*Id.*, Col. 6, ll. 41-51).

While Xu *et al.* discloses a GRIN lens with curved input and output sidewalls, Xu *et al.* fails to disclose either a substrate, or a GRIN multilayer structure deposited on the substrate, as recited in claim 47. Xu *et al.* discloses an optical molding and forming process. Xu *et al.* is silent on depositing a GRIN multilayer structure on a substrate. Indeed, the process disclosed in Xu *et al.* is oriented to a completely different technology from the invention recited in claim 47. Therefore Xu *et al.* teaches away from, or at the very least fails to suggest, the recitations of claim 47. Because Xu *et al.* fails to disclose or suggest all of the recitations of claim 47, Xu *et al.* cannot anticipate claim 47. Also, claims 48-52 depend from claim 47 and are patentable for at least the reasons discussed above for claim 47.

In addition, the dependent claims 49-52 recite features not present in Xu *et al.* For example, claim 49 depends from claim 47 and recites that the substrate comprises at least one of a Si, GaAs, AlN, LiNbO<sub>3</sub> and quartz composition. Claim 50 depends from claim 47 and recites that the substrate comprises a glass. Because Xu *et al.* fails to disclose or suggest a substrate, Xu *et al.* also is silent on the composition of the substrate.

Claim 51 depends from claim 47 and recites a waveguide operatively coupled to the apparatus, wherein a connection between the apparatus and the waveguide is established using photolithography. Xu *et al.* fails to disclose or suggest a waveguide operatively coupled to the apparatus and fails to disclose or suggest forming a connection between the apparatus and a waveguide using lithography.

Claim 52 depends from claim 47 and recites that the apparatus is fabricated in an array form for multi-channel light coupling into or out of a multi-port photonic chip. Xu *et al.* discloses using a GRIN lens with a laser diode lens system (*Id.*, Col. 15, ll. 49-54), but fails to disclose or suggest fabricating the GRIN lens in an array form, multi-channel light coupling, or a multi-port photonic chip. Xu *et al.* further fails to disclose or suggest coupling an array form of the apparatus of claim 47 with a multi-port photonic chip.

Accordingly, Applicant respectfully requests the Examiner to withdraw the rejections of claims 47 and 49-52 under § 102(b) based on Xu *et al.*

**D. Rejections Under 35 U.S.C. § 103(a): Claim 48**

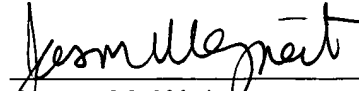
Claim 48 stands rejected under 35 U.S.C. § 103(a) as obvious over Xu *et al.* in view of Zhou *et al.* (U.S. Patent Publication No. 2004/0042729). The Examiner concedes that Xu *et al.* fails to disclose or suggest a photoresist layer spin-coated on a metal layer (Office Action mailed June 7, 2006, at 7). The Examiner asserts that Zhou *et al.* discloses applying a photoresist later to a lens to reduce radiation. *Id.* However, Zhou *et al.* is unavailable as a reference under 35 U.S.C. § 103(a). Under 35 U.S.C. § 103(c), subject matter which qualifies as prior art under 35 U.S.C. § 102(e) “shall not preclude patentability under this section [35 U.S.C. § 103] where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.”

Zhou *et al.* (U.S. Patent Publication No. 2004/0042729) was assigned to the same assignee, Phosistor Technologies, Inc. at the time the present application was made. Therefore, Zhou *et al.* is not available as a reference under 35 U.S.C. § 103(a). Because Xu *et al.* does not disclose or suggest all of the recitations of claim 48, as conceded by the Examiner, Applicants respectfully request withdrawal of the rejections under § 103(a).

**E. Conclusion**

Applicant respectfully submits that the pending claims are patentable, and requests withdrawal of the pending rejections and allowance of the claims. The Examiner is invited to contact the undersigned Attorney for Applicant via telephone if the Attorney can answer any of the Examiner's questions.

Respectfully submitted,



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